AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of segmenting an image of pixels into a number of ~~contiguous~~ fields corresponding to lay-out elements of the image, the pixels having a value representing an intensity and/or color of a picture element, the method comprising:

constructing a graph having vertices and edges connecting the vertices, on the basis of background areas in the image, said graph edges corresponding to field separators that together delineate the ~~contiguous~~ fields of the image~~, wherein each pixel is comprised in one single field of the number of contiguous fields~~;

constructing a list of contiguous shortest cycles that together completely cover at least a part of the image, a shortest cycle being defined as a closed path from a vertex back to that same vertex via the edges of the graph, that has the lowest sum of weights of edges of all possible closed paths from said vertex back to said vertex; and

defining the shortest cycles of the list as the ~~contiguous~~ fields of the image, wherein said step of defining comprises:

determining an enclosed area for each shortest cycle in the list of shortest cycles, and

sorting the list of shortest cycles based on the size of the enclosed area,

wherein any further processing of the image is performed successively on fields corresponding to the shortest cycles in the order of the sorted list.

2. (Original) The method as claimed in claim 1, further comprising:

assigning a weight to an edge in accordance with a predetermined property.

3. (Original) The method as claimed in claim 2, wherein the predetermined property is an Euclidean distance between the vertices of said edge.

4. (Original) The method as claimed in claim 1, wherein said step of constructing the list of shortest cycles comprises:

selecting an edge that can be part of at most a single shortest cycle,

determining the shortest path that connects the vertices of said edge alternative to said edge, and

combining said edge and said shortest path.

5. (Original) The method as claimed in claim 4, wherein in the selecting step, the edge that can be part of at most a single shortest cycle is an edge at an outer border of the graph.

6. (Original) The method as claimed in claim 1, wherein said step of constructing the list of shortest cycles is an iterative process, wherein, after finding a shortest cycle, the graph is reduced by removing any edge that is part of that shortest cycle and that cannot be part of a further shortest cycle, and then a next shortest cycle is determined.

7. (Original) The method according to claim 6, wherein said step of constructing the list of shortest cycles is terminated when the graph does not have any remaining edges.

8. (Original) The method as claimed in claim 1, wherein the shortest cycle is determined by constructing a minimal spanning tree, which represents all shortest paths from a root vertex to the other vertices, and the minimal spanning tree is represented in variables associated with the vertices of the graph.

9. (Original) The method as claimed in claim 1, wherein said step of defining comprises:

checking if a first shortest cycle that encloses a first area completely includes a second shortest cycle that encloses a second area smaller than the first area, and

subtracting the second enclosed area from the first enclosed area.

10. (Cancelled)

11. (Currently Amended) The method as claimed in ~~claim 10~~claim 1, further comprising:

a processing step wherein a reading order is detected for a field corresponding to any one of the shortest cycles, wherein foreground components within the field are joined to text lines in a direction corresponding to said reading order.

12. (Currently Amended) A computer-readable storage medium containing a computer program comprising computer-executable instructions for segmenting an image of pixels into a number of ~~contiguous~~ fields corresponding to lay-out elements of the image, the pixels having a value representing an intensity and/or color of a picture element, the computer program further comprising computer-executable instructions for:

constructing a graph having vertices and edges connecting the vertices, on the basis of background areas in the image, said graph edges corresponding to field separators that together delineate the ~~contiguous~~ fields of the image~~, wherein each pixel is comprised in one single field of the number of contiguous fields~~;

constructing a list of contiguous shortest cycles that together completely cover at least a part of the image, a shortest cycle being defined as a closed path from a vertex back to that same vertex via the edges of the graph, that has the lowest sum of weights of edges of all possible closed paths from said vertex back to said vertex; and

defining the shortest cycles of the list as the ~~contiguous~~ fields of the image, wherein said step of defining comprises:

determining an enclosed area for each shortest cycle in the list of shortest cycles, and

sorting the list of shortest cycles based on the size of the enclosed area,

wherein any further processing of the image is performed successively on fields corresponding to the shortest cycles in the order of the sorted list.

13. (Previously Presented) The computer-readable storage medium as claimed in claim 12, further comprising computer-executable instructions:

assigning a weight to an edge in accordance with a predetermined property.

14. (Previously Presented) The computer-readable storage medium as claimed in claim 12, wherein said computer-executable instructions for constructing the list of shortest cycles comprise computer-executable instructions for:

selecting an edge that can be part of at most a single shortest cycle,

determining the shortest path that connects the vertices of said edge alternative to said edge, and

combining said edge and said shortest path.

15. (Previously Presented) The computer-readable storage medium as claimed in claim 12, wherein, after finding a shortest cycle, the graph is reduced by removing any edge that is part of that shortest cycle and that cannot be part of a further shortest cycle, and then a next shortest cycle is determined.

16. (Previously Presented) The computer-readable storage medium as claimed in claim 12, wherein the shortest cycle is determined by constructing a minimal spanning tree, which represents all shortest paths from a root vertex to the other vertices, and the minimal spanning tree is represented in variables associated with the vertices of the graph.

17. (Previously Presented) The computer-readable storage medium as claimed in claim 12, further comprising computer-executable instructions for:

performing a processing step wherein a reading order is detected for a field corresponding to any one of the shortest cycles, wherein foreground components within the field are joined to text lines in a direction corresponding to said reading order.

18. (Currently Amended) A device for segmenting an image of pixels into a number of ~~contiguous~~ fields corresponding to lay-out elements of the image, the pixels having a value representing an intensity and/or color of a picture element, the device comprising:

an input unit for inputting an image; and

a processing unit including:

a graph constructor for constructing a graph including vertices and edges connecting the vertices, on the basis of background areas in the image, said graph edges corresponding to field separators that together delineate the ~~contiguous~~ fields of the image,

a pathfinding module for determining within the graph a closed path from a vertex back to that same vertex via the edges of the graph, that has the lowest sum of weights of edges of all possible closed paths from said vertex back to said vertex,

a list module for constructing a list of contiguous shortest cycles that together completely cover at least a part of the image, and

a field definer for defining the shortest cycles of the list as the ~~contiguous~~ fields of the image, wherein ~~each pixel is comprised in one single field of the number of contiguous fields~~ said field definer is further configured to:

determine an enclosed area for each shortest cycle in the list of shortest cycles, and

sort the list of shortest cycles based on the size of the enclosed area,

wherein any further processing of the image is performed successively by the processing unit on contiguous fields corresponding to the shortest cycles in the order of the sorted list.

19. (Original) The device as claimed in claim 18, wherein the processing unit further comprises:

a weight assigner for assigning a weight to an edge in accordance with a predetermined property.

20. (Original) The device as claimed in claim 19, wherein the predetermined property is an Euclidean distance between the vertices of said edge.

21. (Currently Amended) The device as claimed in claim 18, further comprising:

a display unit for displaying ~~contiguous~~ fields of the image after segmenting.

22. (Original) The device as claimed in claim 18, wherein the list module is arranged for iteratively finding shortest cycles by removing any edge from the graph that is part of a shortest cycle to be included on the list and that cannot be part of a further shortest cycle, and terminating constructing the list when the graph does not have any remaining edges.

23. (Currently Amended) The device as claimed in claim 18, wherein the processing unit detects a reading order for a field corresponding to any one of the shortest cycles, and foreground components within the ~~contiguous~~ fields are joined to text lines in a direction corresponding to said reading order.

24-25. (Cancelled)